

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 349041P	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/CA2004/001773	International filing date (<i>day/month/year</i>) 04 October 2004 (04-10-2004)	Priority date (<i>day/month/year</i>) 02 October 2003 (02-10-2003)
International Patent Classification (IPC) or national classification and IPC IPC: C08L 53/02 (2006.01) , F42B 12/72 (2006.01) , C08L 23/22 (2006.01) , C08L 23/16 (2006.01) , B29C 45/00 (2006.01) , B29C 43/00 (2006.01)		
Applicant THE UNIVERSITY OF WESTERN ONTARIO ET AL		
1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of <u>18</u> sheets, as follows: <input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions). 4. This report contains indications relating to the following items: <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input checked="" type="checkbox"/> Box No. VII Certain defects in the international application <input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application		
Date of submission of the demand 02 August 2005 (02-08-2005)	Date of completion of this report 15 February 2006 (15-02-2006)	
Name and mailing address of the IPEA/CA Canadian Intellectual Property Office Place du Portage I, C114 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No.: 001(819)953-2476	Authorized officer <div style="text-align: right;">Tony F. Neppel (819) 997-2890</div>	

Box No. I Basis of the report

1. With regard to the language, this report is based on:
- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rules 12.3(a) and 23.1(b))
- ☐ publication of the international application (Rule 12.4(a))
- ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- ☒ pages 2-6, 8-10, 13, 14, 16, 18 and 23-29 as originally filed/furnished
- ☒ pages* 1,7,11,12,12a,15,17,17a and 19-22 received by this Authority on 6 September 2005
- ☐ pages* _____ received by this Authority on _____
- ☒ the claims:
- ☐ pages _____ as originally filed/furnished
- ☐ pages* _____ as amended (together with any statement) under Article 19
- ☒ pages* 30-35 received by this Authority on 6 September 2005
- ☐ pages* _____ received by this Authority on _____
- ☒ the drawings:
- ☒ pages 1 - 7 as originally filed/furnished
- ☐ pages* _____ received by this Authority on _____
- ☐ pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.
3. ☒ The amendments have resulted in the cancellation of:
- ☒ the description, pages pages 1, 7, 11, 12, 15, 17 and 19-22 as originally filed
- ☒ the claims, Nos. 1 - 33 as originally filed
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of those sheets may be marked "superseded."

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	1 to 37	YES
	Claims	none	NO
Inventive step (IS)	Claims	1 to 37	YES
	Claims	none	NO
Industrial applicability (IA)	Claims	1 to 37	YES
	Claims	none	NO

2. Citations and explanations (Rule 70.7)

Reference is made to the documents cited in the Written Opinion (WO) of the International Searching Authority, denoted as D1 to D5.

Novelty and Inventive Step - Articles 33(2) and 33(3) PCT

As pointed out in the WO, the claimed subject matter appears to be novel in view of documents D1 to D5. On 6 September 2005, Applicant amended the originally filed set of claims under Article 34 PCT. The amended claims have retained novelty. Thus, current claims 1 to 37 are considered to comply with Article 33(2) PCT.

With regard to the question whether the current claims involve an inventive step, documents D1 and D2 appear to be most relevant. In any case, no doubt remains that D1 combines a thermoplastic elastomer (TPE), such as an SBS or SEBS block copolymer with an *uncrosslinked soft* elastomer, particularly an EPR, as well as with a high specific gravity filler in the presence of an inert polymer. Likewise, it seems clear that D2 combines a TPE and a high specific gravity filler with a rigid thermoplastic polymer, such as PP. Thus, if a skilled person had replaced the rigid thermoplastic polymer component in a composition disclosed in D2, with the soft elastomer component of D1, he or she would probably have arrived at a composition within the scope of at least some of Applicant's claims, for example, of current claims 1 and 27.

At the same time, it is appreciated that none of documents D1 to D5 seems to teach or suggest the replacement of a *rigid* thermoplastic polymer with a *uncrosslinked soft* elastomer, such as an EPR. Even in combination, these documents do not appear to hint at such a replacement or to motivate a skilled person to carry out a replacement of this kind. Furthermore, it becomes apparent from the state of the art at the claim date that replacing a rigid thermoplastic polymer with an uncrosslinked soft elastomer is not common practice in the art and is not generally regarded as a day-by-day workshop improvement. It tends to follow that, as amended, claims 1 to 37 are believed to involve an inventive step and to comply with Article 33(3) PCT.

Industrial Applicability - Article 33(4) PCT

Claims 1 to 37 are considered to define industrially applicable subject matter and to comply with Article 33(4) PCT.

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

On page 1 of the description, Applicant refers to an unpublished United States application. This document has not been identified adequately.

On page 12 of the description, the meaning of the last sentence remains unclear, particularly at lines 31 and 32.

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claims 1, 12 to 14, 23, 27 to 31 and 34 to 37 do not comply with Article 6 PCT for the following reasons:

- (1) In claims 1, 12 to 14 and 31, the “sufficiently high specific gravity material” and “high specific gravity material” lack an adequate definition. Furthermore, the claimed ammunition or composite material which contains this high specific gravity material without any additional boundary, does not draw sufficient support from the description. The description states at page 6, lines 4 to 6:

“This has been achieved in the present invention by using a composite material including a compacted mixture of fine metal powder, a thermoplastic block copolymer and an elastomer.” (emphasis added)

In this regard, Applicant suggests in its response dated 6 September 2005 that a metal or metal oxide powder is only a preferred embodiment of the above high specific gravity material, and any sufficiently high specific gravity material may be suitably employed in the claimed ammunition or composite material. This suggestion appears to be based on a statement at page 14, lines 4 to 6 of the description, namely:

“Within the above preferred criteria, therefore any particulate high specific gravity material may be used as this component of the composite of the invention.” (emphasis added)

The “above preferred criteria” inevitably refer to criteria concerning the high specific gravity material which are set forth in the preceding lines of page 14 and on pages 6 to 13 of the description. These criteria include, inter alia, the previously quoted statement from page 6 which requires the presence of a fine metal powder or, in view of further statements in the description, of a metal oxide powder. It seems to follow that a fine metal or metal oxide powder is an essential component of the ammunition or composite material defined in each of claims 1, 12 to 14 and 31. This conclusion draws further support from the fact that the description does not appear to show any evidence for the utility of any high specific gravity material other than a fine metal or metal oxide powder.

- (2) In claims 23 and 27, the value of the threshold dynamic mechanical compression creep is not defined. Whereas the term “dynamic mechanical compression creep” is, of course, well known in the art, these claims fail to show what its threshold value is. Moreover, the description appears to require a threshold creep of not higher than 20 % for the claimed ammunition or composite material. In particular, Applicant states at page 17, lines 6 and 7 of the description: “Materials with creep higher than 20 % would have poor shape retention.” Since claims 23 and 27 set forth that the claimed ammunition or composite material maintains its shape, it tends to follow that the same ammunition and composite material have a threshold dynamic mechanical compression creep of 20 %.
- (3) The polymer-based ammunition of claim 28 has no antecedent in claim 27. Instead, claim 27 is directed to a composite material. Likewise, the composite materials of claims 29 to 31 have no antecedent in claim 28. Furthermore, the composite material of claim 34 lacks antecedent in claims 26 and 28 as these two claims are directed to polymer-based ammunitions. In a similar way, the polymer-based ammunitions of claims 35 and 36 lack antecedent in claims 27 and 29 to 33, and the polymer-based ammunition of claim 37 lacks antecedent in claims 27 and 29 to 34. Instead of a polymer-based ammunition, claims 27 and 29 to 34 define composite materials. It appears that Applicant might wish to direct claims 28 and 35 to 37 to a composite material rather than a polymer-based ammunition.